



### Programme of Module "Networks"

- Code: DT0341
- Type of course unit: Compulsory (Master Degree in Applied Data Science curriculum Data for Smart City), Compulsory (Master Degree in Applied Data Science curriculum Data for Life Science)
- Level of course unit: Postgraduate Degrees
- Semester: 2

Number of ects credits: (Master Degree in Applied Data Science) 6 (workload 150 hours)

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<b>1</b>	<b>Course objectives</b>	The student will be able to manage and analyze networks from several aspects.
<b>2</b>	<b>Course content and learning outcomes (dublin descriptors)</b>	<p>Topics of the module include:</p> <ul style="list-style-type: none"> <li>• Fundamentals of graph theory and Notation</li> <li>• Linear Algebra and Norms</li> <li>• Node Similarity Measures and algorithms</li> <li>• Network Generators</li> <li>• Key Players of a Network and Centralities measures</li> <li>• Networks and communities: algorithms and metrics.</li> </ul> <p>On successful completion of this module, the student should :</p> <ul style="list-style-type: none"> <li>• On successful completion of this course, the student should: Understand: • Where graphs are, why they are important, and what are new applications; • The main challenges from data mining perspective:</li> </ul> <p>Learn: • Analyze networks to understand the properties and the behaviors of individuals          • Think in a research perspective (novelty,clarity,...) • Solve practical problems</p>
<b>3</b>	<b>Course prerequisites</b>	- Knowing at least one Programming Language. - Notions of linear algebra.
<b>4</b>	<b>Teaching methods and language</b>	<p><b>Language:</b> English</p> <p><b>Reference textbooks</b></p> <ul style="list-style-type: none"> <li>• Chakrabarti, D. and Faloutsos, C., <i>Graph mining: laws, tools, and case studies..</i> 2012.</li> <li>• Aggarwal, C.C. and Wang, H. eds, <i>Managing and mining graph data.</i> Springer. 2010.</li> <li>• Easley, D. and Kleinberg, J., <i>Networks, crowds, and markets: Reasoning about a highly connected world.</i> Cambridge University Press. 2010.</li> </ul>
<b>5</b>	<b>Assessment methods</b>	Project, oral presentation of the project and discussion of course topics.